WEBSTER

WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

2009 CMP

Highland @ Sterling Ave **City of SBD** **AM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	*T*	R	*L*	T	R	*L*	T	R	L	*T*	R
Movement 1: 10 secs	X			X								
Movement 2: 20 secs		X	X		X	X						
Movement 3: 10 secs							X			X		
Movement 4: 20 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	1	1	2	S	1	2	S
Unadjusted Volume	45	199	68	79	260	65	93	324	29	54	350	83
Peak Hour Factor (PHF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)			Shrd						Shrd			Shrd
Min. Time or Ped. Time	10	20	20	10	20	20	10	20	20	10	20	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	-

Parameter Values

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)	3400	3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

		***		***			***				***	
Pk. Hr. Vol. (vph)	45	199	68	79	260	65	93	324	29	54	350	83
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	1800	1700	3600	Shrd	1700	3600	Shrd
X or V/C	0.20	0.25	-	0.35	0.24	0.12	0.41	0.33	-	0.24	0.40	-
Effective green (sec)	8	18	-	8	18	18	8	18	-	8	18	-
Split Time (sec)	10	20	-	10	20	20	10	20	-	10	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	20	10	20	-	10	20	-
Delay - 15 min pk (sec/veh)	25	16	-	28	16	16	29	17	-	26	18	-
Level of Service (LOS)	C	B	-	C	B	B	C	B	-	C	B	-
Average 'Q' (veh/ln)	1	2	-	1	2	1	1	2	-	1	3	-
Design 'Q'- ft/ln	40	60	-	40	60	40	40	60	-	40	100	-
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 19
Level of Service - LOS = B

Critical Movements

Weighted Avg Delay (sec) = 20
Level of Service - LOS = B
Intersection Capacity Utilization - ICU = 0.34

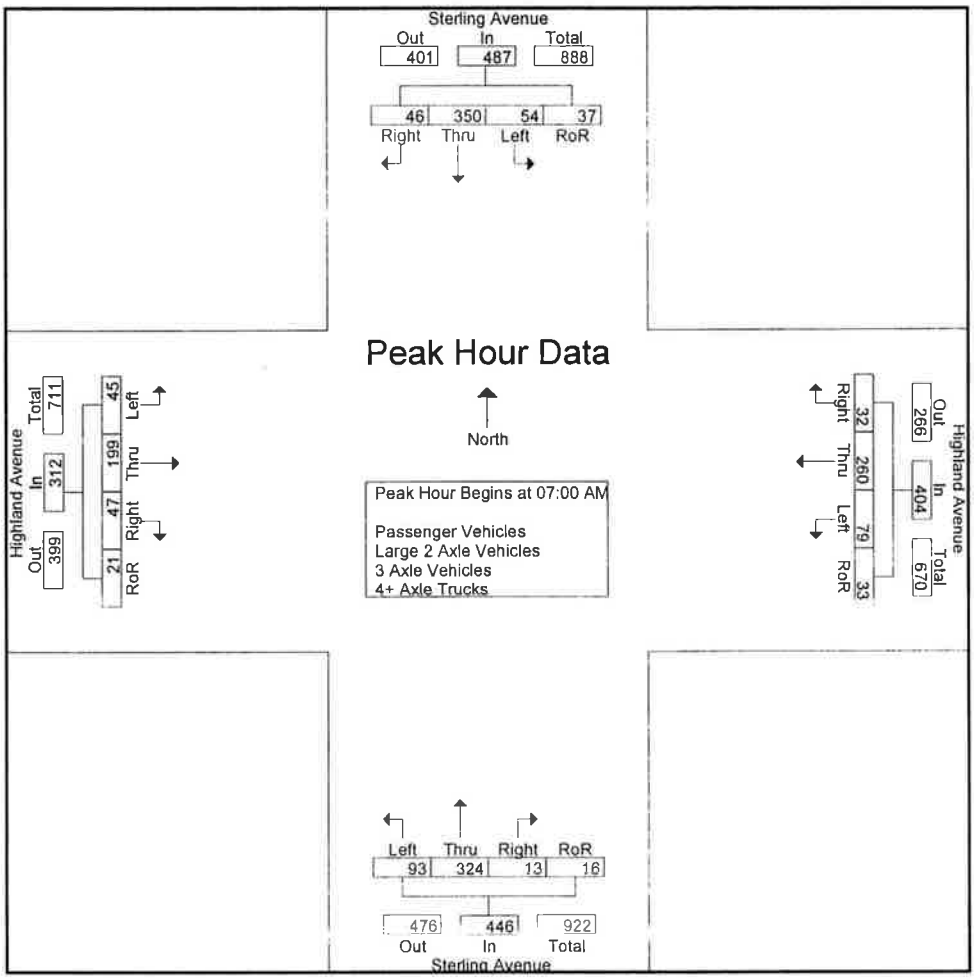
Required Cycle Length is 60 sec

Min./Ped. Times Satisfied

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of San Bernadino
N/S: Sterling Avenue
E/W: Highland Avenue
Weather: Sunny

File Name : SBCSTHIAM
Site Code : 9153009
Start Date : 6/9/2009
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM					07:15 AM					07:00 AM					08:00 AM				
+0 mins.	10	73	8	7	98	**28**	65	**13**	**15**	**121**	21	74	2	2	99	10	42	11	2	65
+15 mins.	**22**	**117**	12	9	**160**	26	**76**	7	9	118	15	**107**	**5**	**5**	**132**	**13**	51	8	**6**	78
+30 mins.	16	102	**17**	**11**	146	11	69	7	8	95	**29**	94	3	4	130	13	54	9	6	82
+45 mins.	6	58	9	10	83	18	49	8	9	84	28	49	3	5	85	11	**64**	**13**	6	**94**
Total Volume	54	350	46	37	487	83	259	35	41	418	93	324	13	16	446	47	211	41	20	319
% App. Total	11.1	71.9	9.4	7.6		19.9	62	8.4	9.8		20.9	72.6	2.9	3.6		14.7	66.1	12.9	6.3	
PHF	.614	.748	.676	.841	.761	.741	.852	.673	.683	.864	.802	.757	.650	.800	.845	.904	.824	.788	.833	.848

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WEbster Based Signal Timing Evaluation Routine

For Capacity and Level of Service Analysis Using HCM 2000 Control Delay

2009 CM(

Highland @ Sterling Ave | **City of SBD** | **PM Peak Hour**

Input

	Eastbound			Westbound			Northbound			Southbound		
Movement Times	L	*T*	R	*L*	T	R	*L*	*T*	R	L	T	R
Movement 1: 10 secs	X			X								
Movement 2: 20 secs		X	X		X	X						
Movement 3: 10 secs							X			X		
Movement 4: 20 secs								X	X		X	X
Movement 5: 0 secs												
Movement 6: 0 secs												
# of Lanes (#, S, P)	1	2	S	1	2	1	1	2	S	1	2	S
Unadjusted Volume	82	495	126	124	409	103	139	380	63	128	216	68
Peak Hour Factor (PHF)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Growth Factor (%)												
Project Trip Volume (vph)												
Sat. Flow Override (vph)			Shrd						Shrd			Shrd
Min. Time or Ped. Time	10	20	20	10	20	20	10	20	20	10	20	20
Permissive Veh/Cycle												
Progression Adj. Factor (PAF)	1.00	1.00	-	1.00	1.00	1.00	1.00	1.00	-	1.00	1.00	-

Parameter Values

	Other	Default
Duration of Peak Period (min)		15
Lost Time (sec)		2
Min. Time (Left Turns, sec)		10
Min/Ped Time (Thru Lanes, sec)		20
Sat Flow (1 Left lane, vphg)	1700	1800
Sat Flow (2 Left lanes, vphg)		3500
Sat Flow (1 Thru lane, vphg)	1800	1900
Sat Flow (1 Right lane, vphg)		1800
Vehicle Length (feet)		20

Output

		***		***			***	***				
Pk. Hr. Vol. (vph)	82	495	126	124	409	103	139	380	63	128	216	68
Saturation Flow (vph)	1700	3600	Shrd	1700	3600	1800	1700	3600	Shrd	1700	3600	Shrd
X or V/C	0.36	0.58	-	0.55	0.38	0.19	0.61	0.41	-	0.56	0.26	-
Effective green (sec)	8	18	-	8	18	18	8	18	-	8	18	-
Split Time (sec)	10	20	-	10	20	20	10	20	-	10	20	-
Min. Time or Ped. Time (sec)	10	20	-	10	20	20	10	20	-	10	20	-
Delay - 15 min pk (sec/veh)	28	20	-	33	18	16	36	18	-	34	17	-
Level of Service (LOS)	C	B	-	C-	B	B	D+	B	-	C-	B	-
Average 'Q' (veh/ln)	1	4	-	2	2	1	2	3	-	2	2	-
Design 'Q'- ft/ln	40	120	-	60	60	40	60	100	-	60	60	-
Do Vehicles Clear?	YES	YES	-	YES	YES	YES	YES	YES	-	YES	YES	-

Summary

Whole Intersection

Weighted Avg Delay (sec) = 21
Level of Service - LOS = C+

Critical Movements

Weighted Avg Delay (sec) = 22
Level of Service - LOS = C+
Intersection Capacity Utilization - ICU = 0.52

Required Cycle Length is 60 sec

Min./Ped. Times Satisfied

Counts Unlimited Inc.
25286 Jaclyn Avenue
Moreno Valley, CA 92557
951-485-7934

City of San Bernadino
N/S: Sterling Avenue
E/W: Highland Avenue
Weather: Sunny

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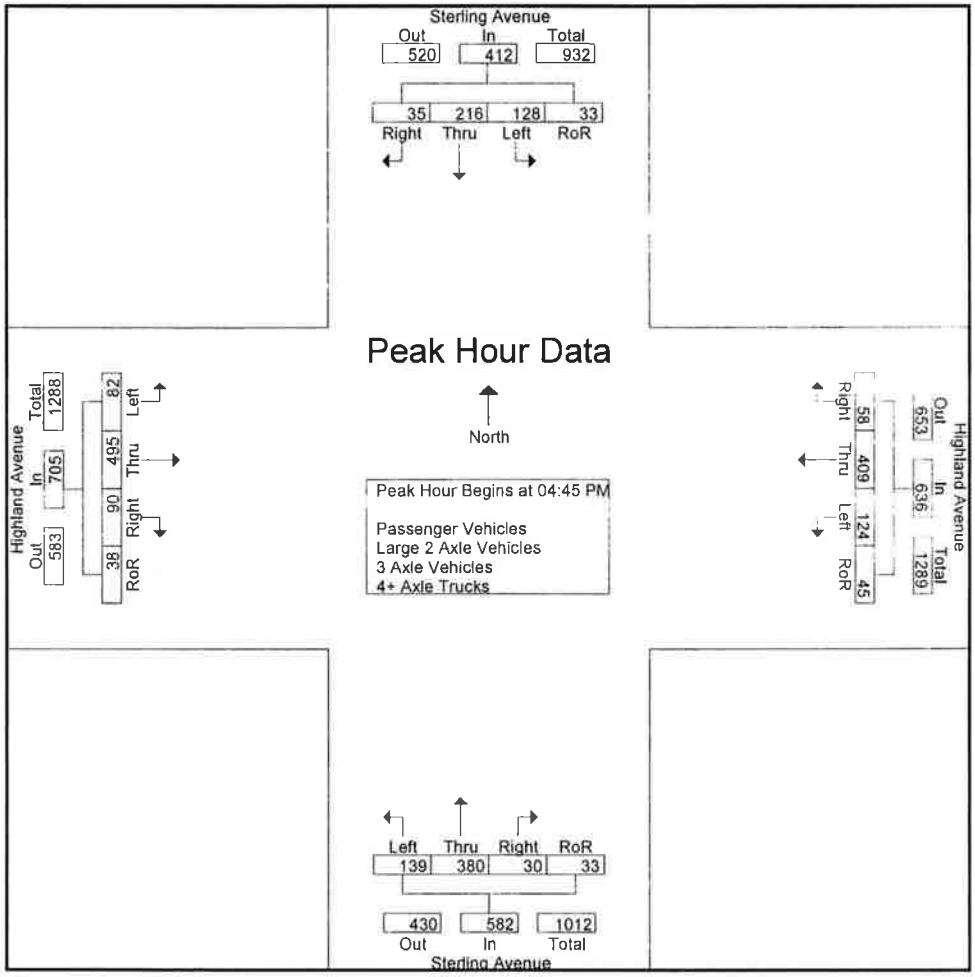

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	05:00 PM					04:15 PM					04:45 PM					04:30 PM				
+0 mins.	32	**55**	8	5	100	32	**131**	16	16	**195**	**42**	94	**11**	3	150	19	121	**24**	6	170
+15 mins.	28	53	**16**	11	**108**	25	112	18	**24**	179	32	85	4	6	127	**27**	108	19	9	163
+30 mins.	32	52	7	10	101	31	92	13	14	150	31	97	8	11	147	21	**148**	22	**11**	**202**
+45 mins.	**36**	**54**	**6**	**12**	108	**35**	103	**20**	12	170	**34**	**104**	7	**13**	**158**	16	126	23	9	174
Total Volume	128	214	37	38	417	123	438	67	66	694	139	380	30	33	582	83	503	88	35	709
% App. Total	30.7	51.3	8.9	9.1		17.7	63.1	9.7	9.5		23.9	65.3	5.2	5.7		11.7	70.9	12.4	4.9	
PHF	.889	.973	.578	.792	.965	.879	.836	.838	.688	.890	.827	.913	.682	.635	.921	.769	.850	.917	.795	.877